



Public Transport Experience

Prof. Hermann Knoflacher
 Institute for Transport Planning and Traffic Engineering
 University of Technology
 Vienna

www.ivv.tuwien.ac.at
hermann.knoflacher@tuwien.ac.at

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008 1

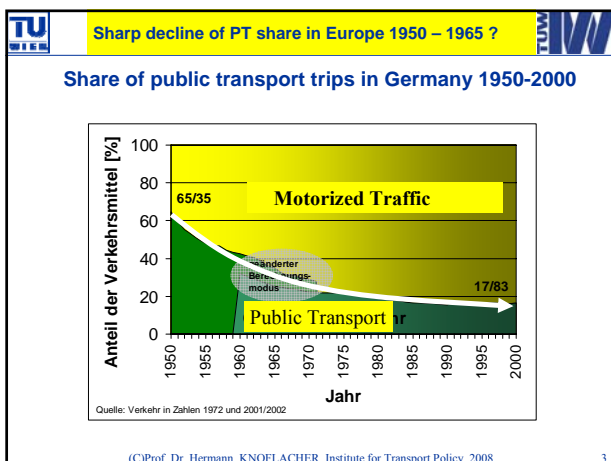
PT – History and Tradition



History of PT

No Competitors for a long time
Believe on a kind or „natural monopoly“

Risks:
Not recognized the changes in urban structure
Not recognized competitors

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008 2








Is there an Ignorance of operators, experts and decision makers

Public Transport is totally dependent on:

- Built environment
- Financial structures
- Organisation
- Information System
- Accessibility

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008 4

Basic Principles for Public Transport Success

PT-Success = PT-Structure(X) x Environment (Y)

PT	=	X	x	Y
1	=	1	x	1



Common View and Treatment:

PT-Success = improving PT x nothing outside

Effect:

<<<< 1 = <1 x <<<1

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008 5

Why this decline

Has it something to do with the basic ignorance about System Behaviour?

Wrong assumptions in transport science?

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008 6

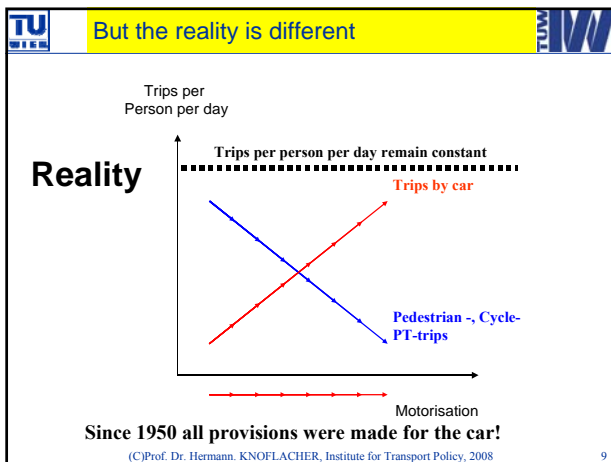
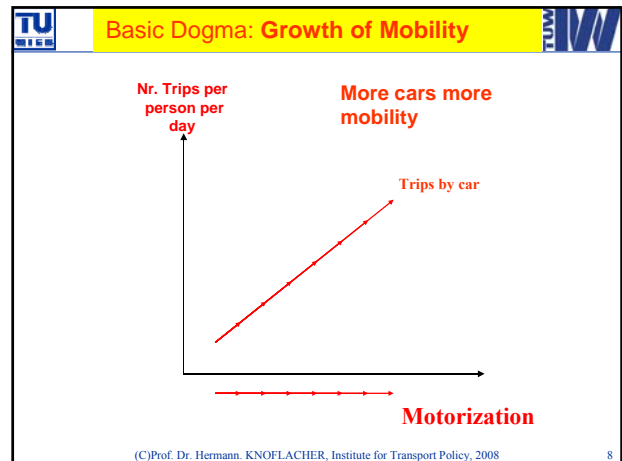
Effects

Loss of market share in Europe

„Forgotten“ in Land Use and Urban Planning

Dependent on subsidies
Financial problems
Structural Problems – Privatisation – Division
Unqualified Regulation by EU Commission

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008 7



Conclusion

There is no „Growth of Mobility“ in the System

Only a Shift from one mode to others occure

PT must compete in the market

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008 10

Transport Market

Transport is a man made structure

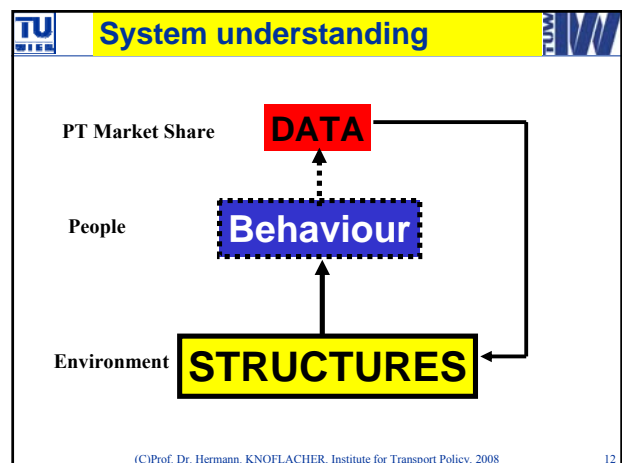
Artificial

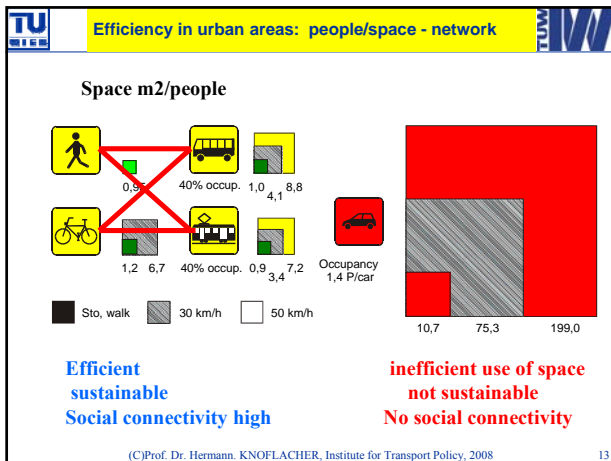
Market conditions are changing with each measure

Building
 Financial regulation
 Organisation
 Information
 Culture

Public Transport

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008 11

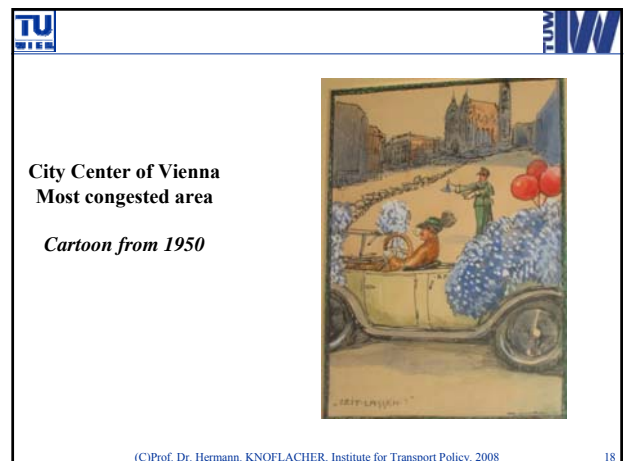




Structures

Pedestrian and Public Transport:
Ideal partners

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008





1974 Structure Change
Pedestrianized City Centre
Vienna

67% PT trips
<10% car trips

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

Structures

Cyclists and Public transport

Partners and fair Competitors

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

Cycles are a competitive mode in urban areas

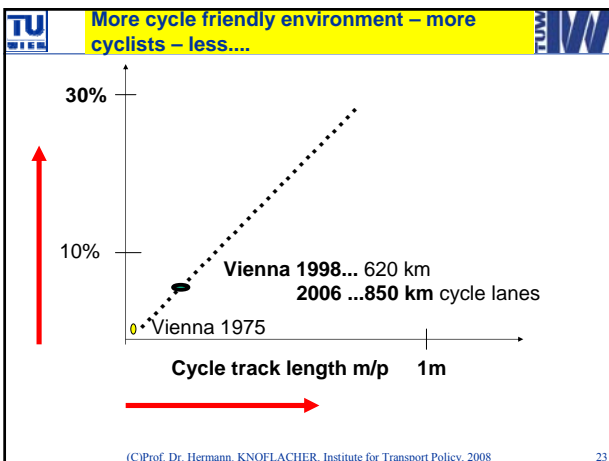
..but a very complementary in rural areas




(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008



(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008





(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008



25



26

Structures

Cars and Public Transport

**Competitors under imbalanced
Market Conditions**

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

27

Travel time and Speed

**Individual Experience does not
reflect System Behaviour**

**To save travel speed huge investments
are made into the transport system**

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

28

What was just built here.....

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

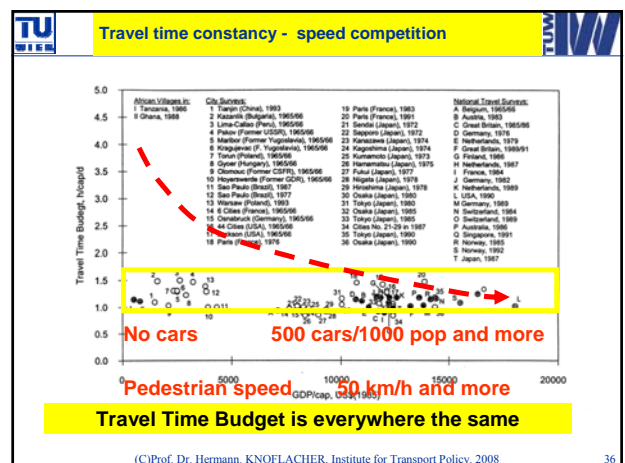
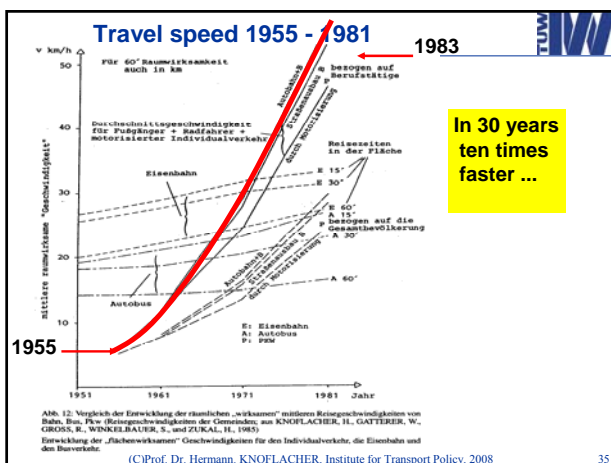
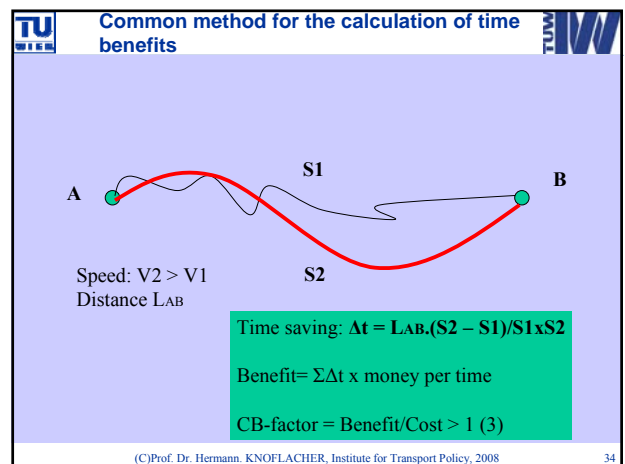
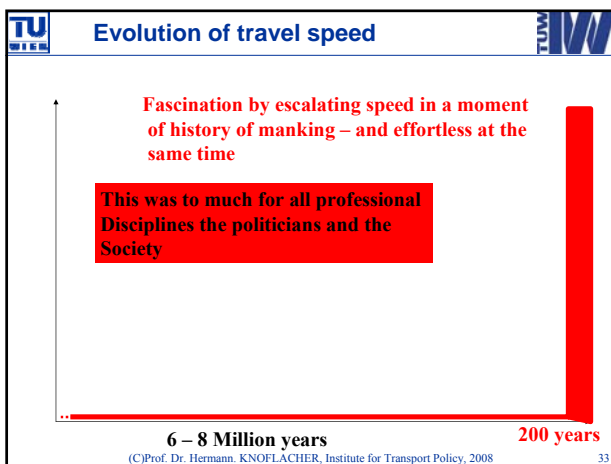
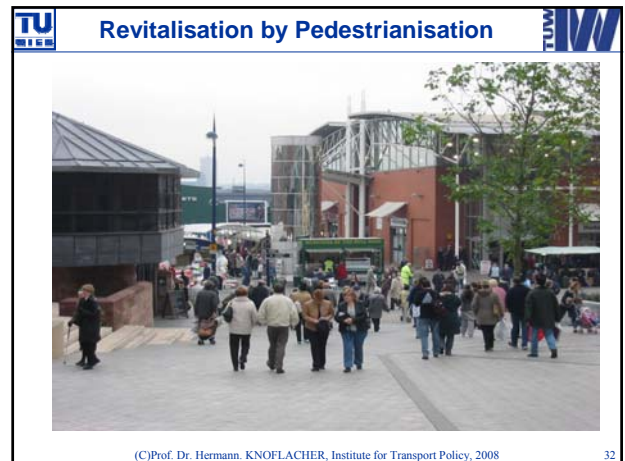
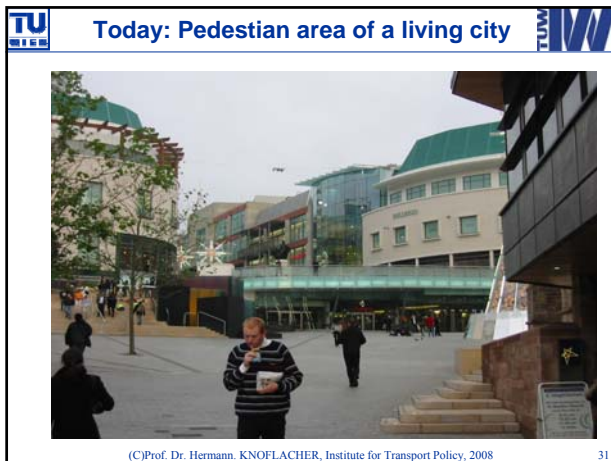
29

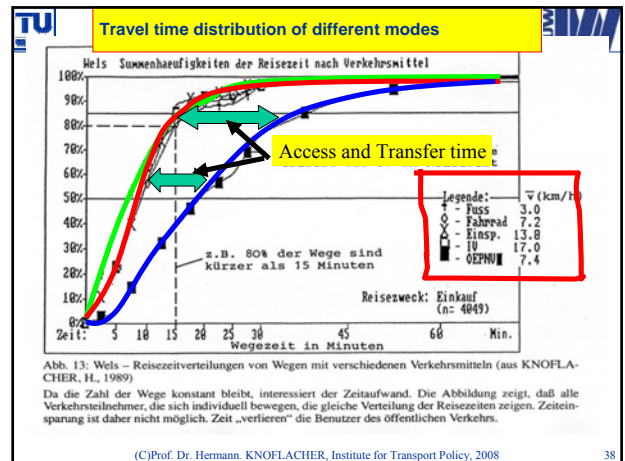
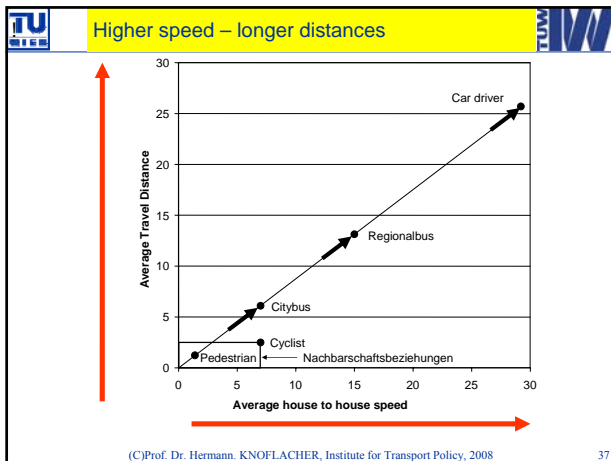
**.....has been removed already her:
Future: Learning from the mistakes of the past**

Birmingham: CONCRETE COLLAR ring motorway 1960s

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

30







How to bring people and PT into accordance?

What is the main cause for the decline of PT?

There are no answers in the Engineering field.
We have to widen our view to other disciplines.

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

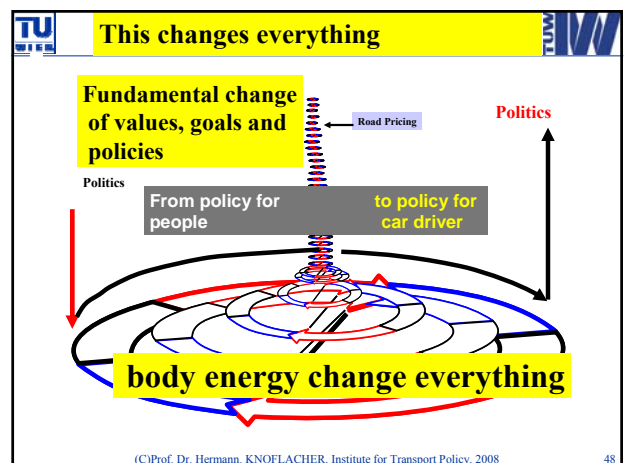
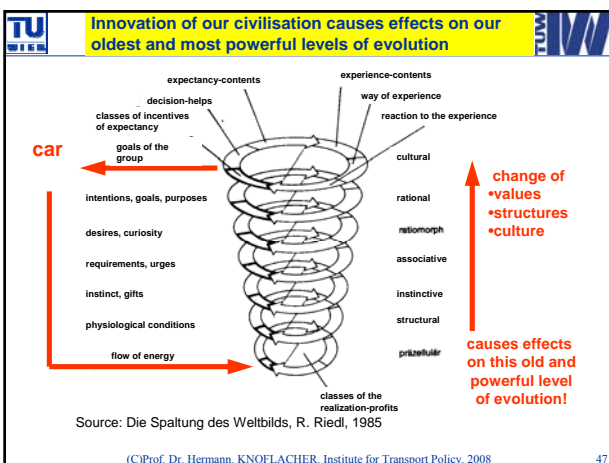
Combination (union) of man and car?

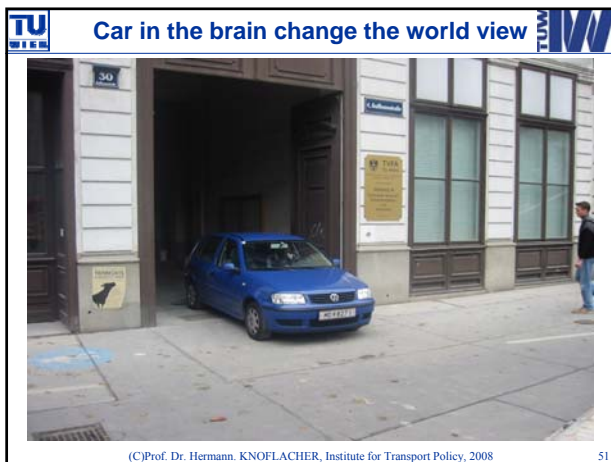
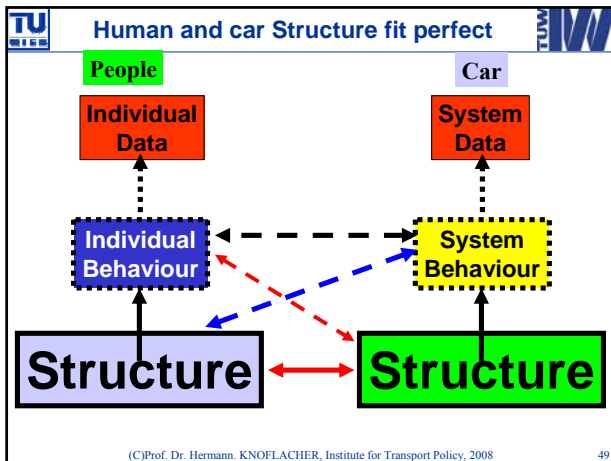
What happen inside the man
Body energy for movement

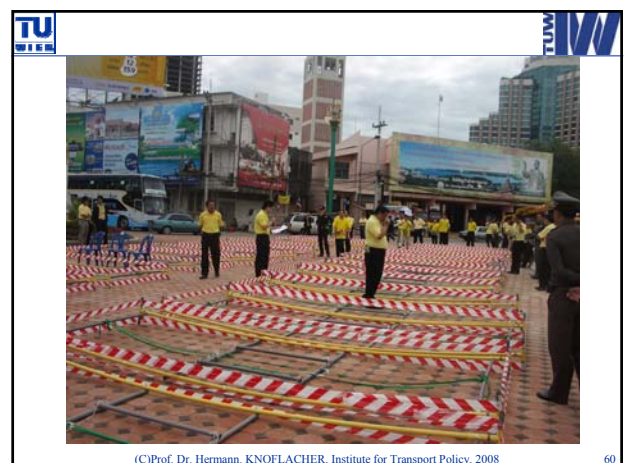
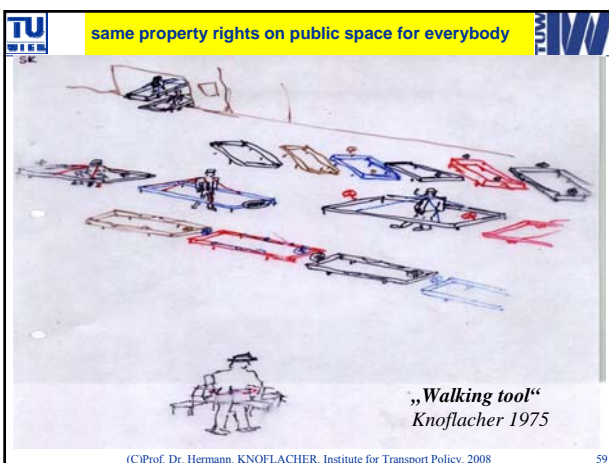
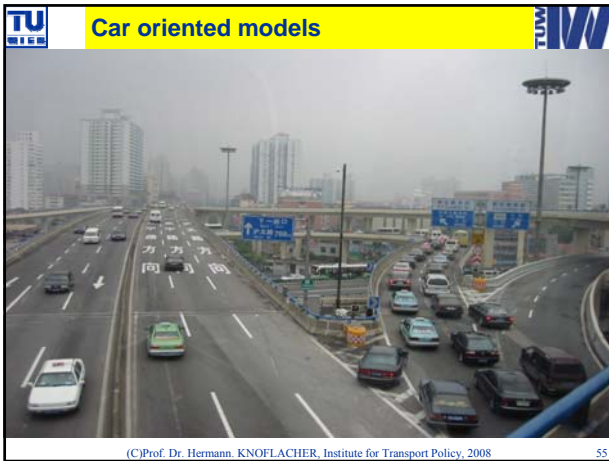
Speed 100 km/h and more 4 (max 36km/)

140 PS 0,1

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008









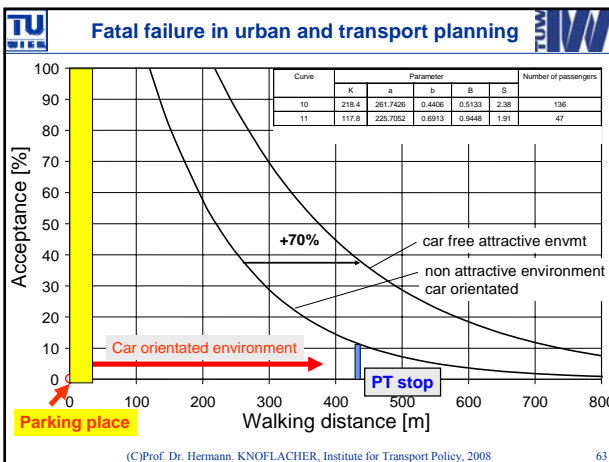
(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

61



(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

62



(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

63

Logarithm and exponential functions are driving the system

Sensation = $\ln(\text{Intensity of Irritation})$

$S = \ln I$

or

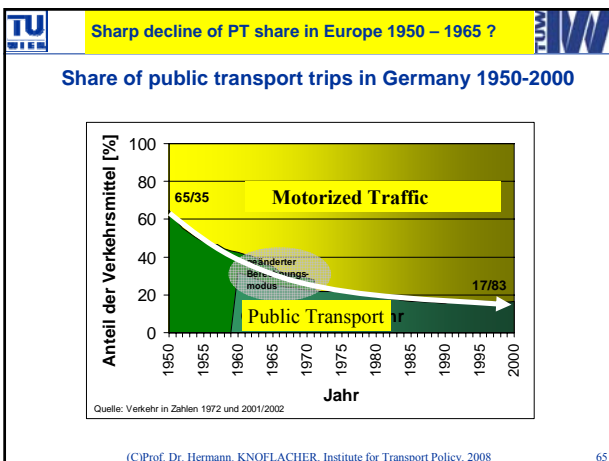
$I = e^{*S}$

Sensation can have a „+“ or „-“ sign

(Knoflacher 1981) discovered the basic function of human behaviour based on Frisch's discovery and Weber-Fechner's Law 1836/1871

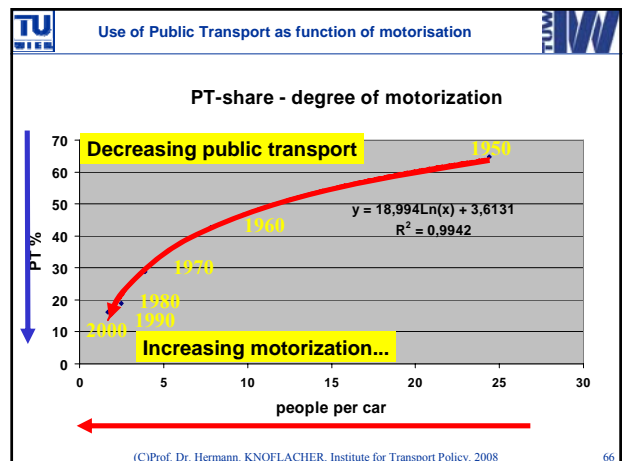
(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

64



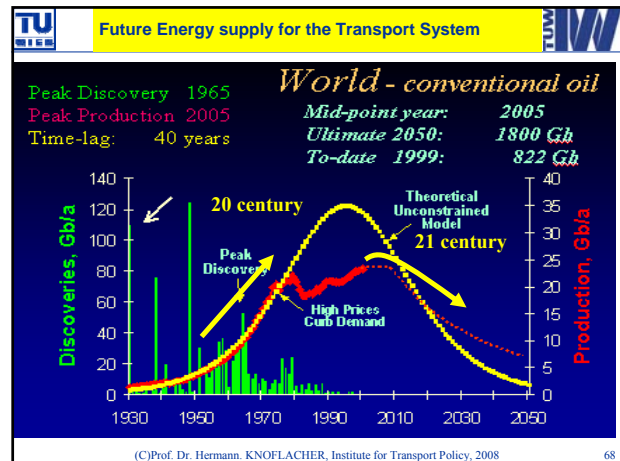
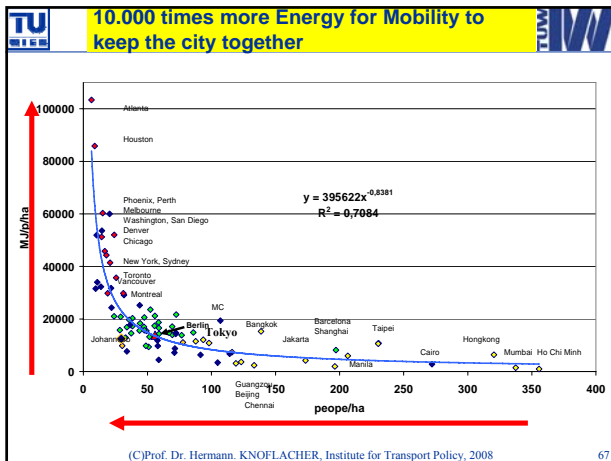
(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

65



(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008

66



Transport modes – Cities - Sustainability

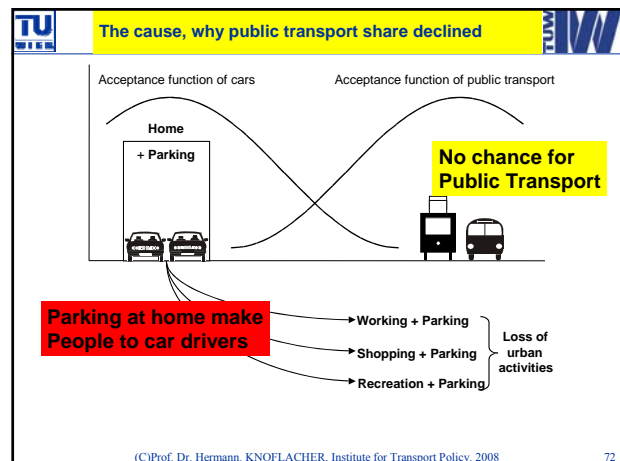
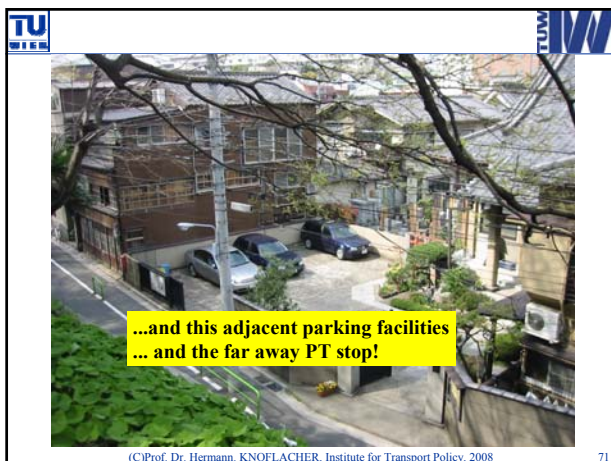
Mode	structure/ max. size	comments
Pedestrian	city 1 million	Sustainable
Pedestrians + Cycles	city 10 Millions	Sustainable
Pedestrians + Cycles + PT	city unlimited	sustainable
Car	sprawling city	not sustainable

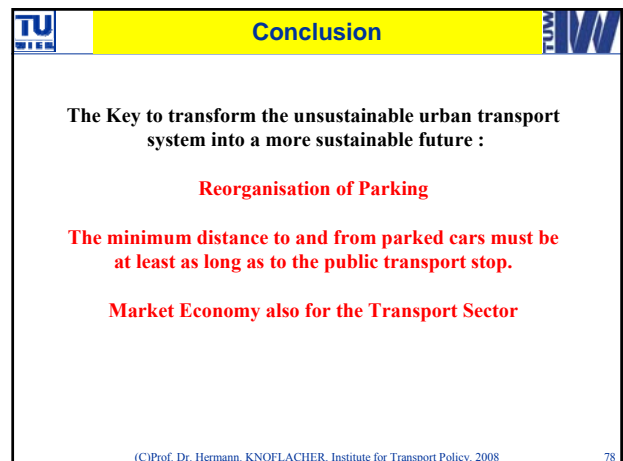
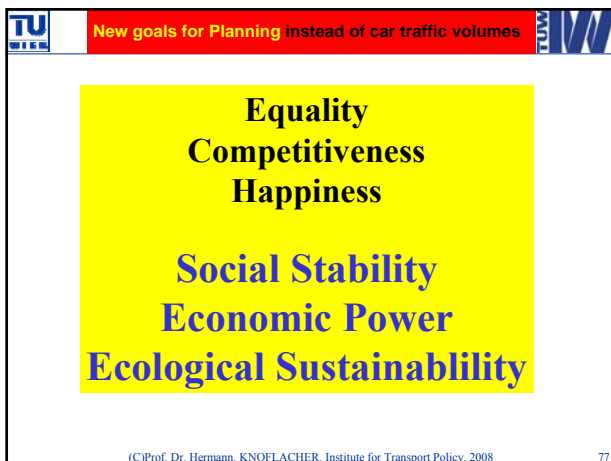
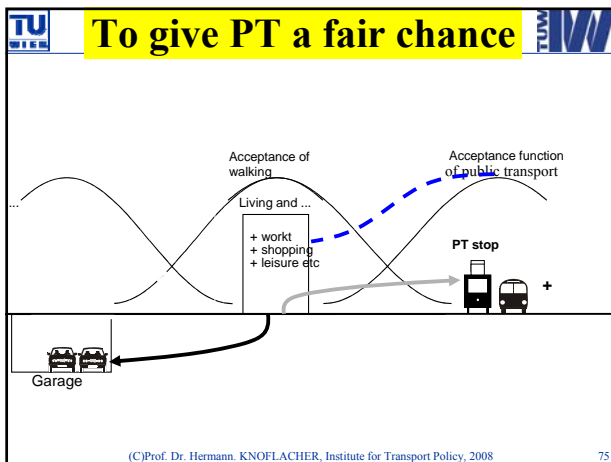
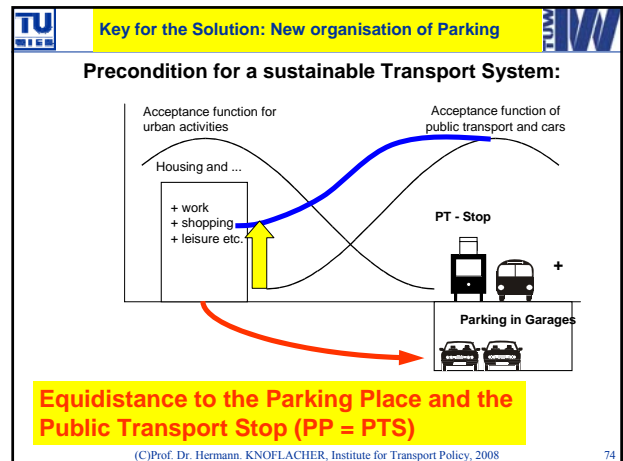
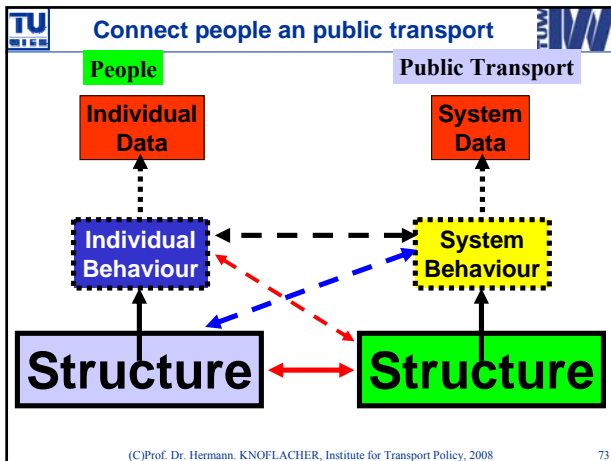
Beijing Area within 5.th motorway ring road

Space enough for 40 – 50 million people in a city of European standard / density of 150 P/ha

Transport system: Public transport, cycles, pedestrian

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008





Policy for the future

- Improved Environment for
 - Pedestrians
 - Cyclists
 - Efficient Public transport
- Compact, multifunctional Urban Structures
- Better Logistics
- Reduction of car infrastructure
- Less Energy Dependency
- Quality of Life
- More local employment

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008
79

How to overcome the problem?

Today Transport is not a Fate

Transport is man made and can be changed in a qualified manner since we know the behaviour of the system and its elements

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008
80

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008
81

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008
82

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008
83

Thank you very much for your attention!

(C)Prof. Dr. Hermann. KNOFLACHER, Institute for Transport Policy, 2008
84